

All you need for...

**SERVA**



## Native PAGE

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Sample Preparation for Native PAGE

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SERVA Native PAGE Gels

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SERVA Native PAGE Buffers

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SERVA Protein Standards

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SERVA Stains for Native PAGE

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Native PAGE Equipment

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## All you need for... Native PAGE

Blue and Clear Native electrophoresis in polyacrylamide gels (BN/CN PAGE) separates proteins according to their native state, i.e. by their intrinsic charge and size.

Blue Native PAGE (BN PAGE) makes use of Coomassie® Brilliant Blue G 250 to bind to the outer surface of protein complexes leading to a negatively charged protein-dye complex. The Blue G dye does not act as a detergent thus maintaining the native structure of the protein throughout the electrophoresis process. At physiological

pH, the protein-dye complexes migrate independently towards the anode. The repulsion between the negatively charged protein-dye complexes leads to high resolution and band sharpness.

Clear Native PAGE (CN PAGE) works without using any anionic dye. Therefore, migration of proteins through the gel is as well dependent from the intrinsic charge of the protein. This method can be used for separation of proteins with  $pI < 7$  at physiological pH when dyes may interfere with further analytical methods.

1

Sample Preparation for Native PAGE

2

SERVA Native PAGE Gels

3

SERVA Native PAGE Buffers

4

SERVA Protein Standards

5

SERVA Stains for Native PAGE

6

Native PAGE Equipment

SERVA produces gels for more than 30 years – hard to find a place with more experience in manufacturing, developing and supporting the use of electrophoresis gels!

## 1

# Sample Preparation for Native PAGE

## Detergents

To improve the solubility of hydrophobic and membrane proteins you have to add non-ionic detergents to native PAGE sample preparations. They do not interfere with the electrophoretic run, but result in less streaking and better resolution. The

SERVA BN PAGE Detergent Sampler contains 250 mg each of Digitonin and Dodecyl-beta-D-maltoside as well as 500 mg Triton® X-100. The sampler allows you to find the optimal combination and concentration of detergents for your sample.

Product	Size	Cat. No.
Digitonin	500 mg	19550.01
	1 g	19550.02
Digitonin water soluble	250 mg	19551.01
	1 g	19551.02
Dodecyl-beta-D-maltoside	100 mg	20780.01
	500 mg	20780.02
	1 g	20780.03
Octyl-beta-D-glucopyranoside	250 mg	31055.02
	1 g	31055.03
	5 g	31055.01
Triton® X-100	500 g	37240.01
	5 kg	37240.02
SERVA BN PAGE Detergent Sampler	1 kit	20785.01

## Enzymes

Cell and tissue lysates often have a high DNA content, which causes a high viscosity of samples. This impairs separation and resolution of native PAGE. Cyanase™ Nuclease and Salt Active Nuclease are used for effective reduction of viscosity caused by nucleic acids for best separation results. Samples treated with Cyanase™ are suitable

for all downstream applications due to complete removal of the enzyme by Cyanase™ Inactivation Resin.

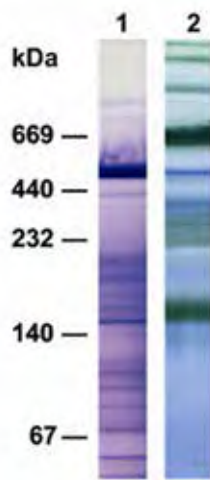
Salt Active Nuclease is the choice for high salt samples. It digests DNA effectively after dissociation of DNA-protein complexes in high salt concentrations (up to 500 mM NaCl).

Product	Size	Cat. No.
Cyanase™ Nuclease	10.000 U	18542.01
	25.000 U	18542.02
Cyanase™ Inactivation Resin	1 ml	18543.01
	5 ml	18543.02
Cyanase™ Inactivation Resin Cartridges	20 react.	18544.01
Salt Active Nuclease	5.000 U	18541.01
	25.000 U	18541.02

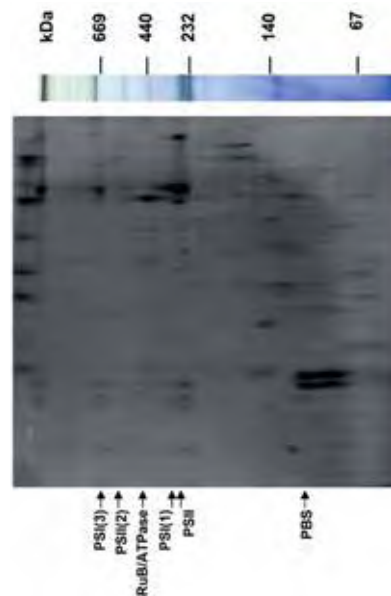
## SERVA Native PAGE Gels

SERVA developed precast gels optimized for a Blue Native/Clear Native PAGE system: SERVAGe™ N for BN and CN PAGE, complemented by buffers and Blue G solution for best results.

For native PAGE in a TRIS/Glycine buffer system SERVA offers the SERVAGe™ PRiME™ gels showing highest resolution with long shelf life.



Lane 1 = Separation of stroma thylakoid membrane complexes by CN PAGE  
Lane 2 = Separation of thylakoid membrane complexes by BN PAGE. By courtesy of Friedrich Ossenbuehl (University of Ulm).



Separation of thylakoid membrane complexes by 2D BN/SDS PAGE. By courtesy of Friedrich Ossenbuehl (University of Ulm).

Precast Gels for Native BN/CN PAGE	12 wells	10 wells
SERVAGe™ N 3 - 12 %	43250.01	43251.01
SERVAGe™ N 4 - 16 %	43253.01	43252.01
SERVAGe™ N Native Starter Kit	-	43204.01
Precast TRIS/Glycine PRiME™ Gels	12 wells	10 wells
SERVAGe™ TG PRiME™ 8 %	43260.01	43261.01
SERVAGe™ TG PRiME™ 10 %	43263.01	43264.01
SERVAGe™ TG PRiME™ 12 %	43266.01	43267.01
SERVAGe™ TG PRiME™ 14 %	43269.01	43270.01
SERVAGe™ TG PRiME™ 4 - 12 %	43273.01	43274.01
SERVAGe™ TG PRiME™ 4 - 20 %	43276.01	43277.01
SERVAGe™ TG PRiME™ 8 - 16 %	43279.01	43280.01

## 3

## SERVA Native PAGE Buffers

SERVA offers a complete range of buffers for native PAGE.

Product	Size	Cat. No.
Native Anode Buffer for Blue/Clear Native (10x)	1 L	42535.01
Native Cathode Buffer for Blue/Clear Native (10x)	500 ml	42536.01
Sample Buffer for Blue Native (2x)	20 ml	42533.01
Sample Buffer for Clear Native (2x)	20 ml	42534.01
SERVA Blue G solution for BN, 1 %	20 ml	42538.01
SERVA Tris-Glycine Native Electrophoresis Buffer (10x)	1 L	42530.01
SERVA Tris-Glycine Native Sample Buffer (2x)	20 ml	42528.01

## 4

## SERVA Protein Standards

The **SERVA Native Marker Liquid Mix for BN/CN PAGE** is ready-to-use and contains 6 different proteins ranging from 21 up to 720 kDa.

The **Protein Molecular Weight Standards Kit** is a set of 8 single proteins. Proteins are lyophilized and could easily be dissolved in water or sample buffer to the desired final concentration.

SERVA Native Marker Liquid Mix for BN/CN PAGE (cat. no. 39219) separated by Clear Native PAGE on SERVAGE<sup>™</sup> N 4-16 % (cat. no. 43252)



Ferritin horse ( $M_r$  450 000/720 000)

Urease jack bean ( $M_r$  272 000/545 000)

Lactate dehydrogenase porcine ( $M_r$  146 000)

Albumin bovine ( $M_r$  67 000)

Albumin egg ( $M_r$  45 000)

Trypsin inhibitor soybean ( $M_r$  21 000)

Product	Size	Cat. No.
SERVA Native Marker Liquid Mix for BN/CN PAGE	5x 50 $\mu$ l	39219.01
Protein Molecular Weight Standards*	1 kit	39064.01

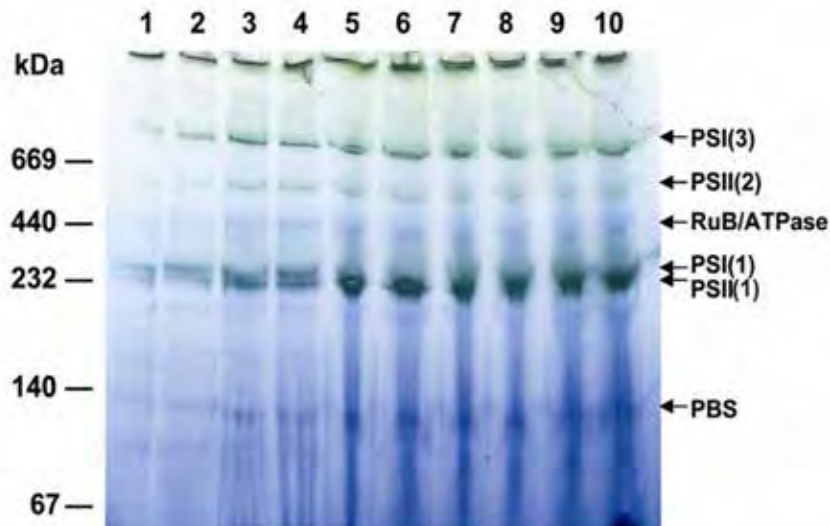
\*25 mg each of Ferritin horse,  $M_r$  450 000; Catalase bovine,  $M_r$  240 000; Aldolase rabbit,  $M_r$  160 000; Albumin bovine,  $M_r$  67 000; Albumin egg,  $M_r$  45 000; Chymotrypsinogen A,  $M_r$  25 000; Myoglobin equine,  $M_r$  17 800; Cytochrome C,  $M_r$  12 400.

Protein Standards in native PAGE are valuable tools to verify separation results.

## SERVA Stains for Native PAGE

Native PAGE gels are stained with Coomassie®, silver or zinc-imidazole stains. To receive best results for Blue Native PAGE gels change the cathode buffer containing Coomassie® Blue G after half of the run time against cathode buffer without dye.

	Quick Coomassie® Stain	DensiStain Blue G Staining Solution	Silver Staining Kit Native PAGE	SERVASnow Staining Kit
Type of Stain	1-step, non-toxic colloidal Coomassie® G-250	Colloidal Coomassie® G-250	Fast, MS-compatible silver stain	Reversible zinc-imidazole stain
Detection	Visual, colorimetric	Visual, colorimetric	Visual, colorimetric	Visual, colorimetric
Sensitivity	5 ng	30 ng	1 ng	10 ng
Staining time	15 min	30 min	45 - 60 min	20 - 25 min
Quantification	✓	✓	✗	✗
MS compatible	✓	✓	✓	✓
Re-usable	✓	✓	✗	✗
No. of gels stained	40 - 120	20 - 60	25	50
Cat. No.	GEN-QC-Stain-1L	35078.01	35077.01	35080.01



Separation of increasing amounts of thylakoid membrane from *Synechocystis* (lane 1 = 1 µg, ... lane 10 = 10 µg). After half of the run the blue cathode buffer has been replaced by colourless cathode buffer. By courtesy of Friedrich Ossenbuehl (University of Ulm).

SERVA offers a broad range of staining kits for protein gels, not only for native PAGE but also for SDS PAGE, IEF and 2D electrophoresis.

## 6

## Native PAGE Equipment

Not only the quality of the used gels and reagents is crucial to achieve best results in the electrophoretic separation of proteins. Only the use of electrophoresis chambers providing an uniform electric field during the run and a reliable power supply will result in perfect separations.



### BlueVertical™ PRIME™

The BlueVertical™ PRIME™ electrophoresis mini tank system has been developed to run pre-cast gels in 1D SDS PAGE, but also in 2D PAGE, native PAGE, IEF or nucleic acid PAGE applications. The unique innovative clamp system keeps the gel cassettes in their correct position at the inner core running module, leak-free and ready to start within seconds.

### BluePower™ Power Supplies

The BluePower™ Power Supplies are easy to operate and fully programmable. Change parameters without interrupting the run. The power supplies have a stable metal housing and a large LCD display. The upgrade with the BluePower™ Control Kit allows to monitor V, mA and W over time as well as loading and storing of program settings.



### BlueShake 3D

Due to the large platform of angle of 4°, this shaker is the instrument (35 x 35 cm) the best choice for staining and the chosen rotation large format gels.

### Digital Imaging and Analysis System III

The Digital Imaging and Analysis System III is the ideal solution to master the daily tasks of documentation and 1D gel analysis in routine laboratory work. Solid hardware including a digital SLR camera and easy-to-grasp 1D analysis software are combined to provide an excellent tool to meet your needs. UV-, blue- and white-light transilluminator or epi-white light are optional.



Product	Size	Cat. No.
BlueVertical™ PRIME™	BV 104	1 unit
BluePower™ 500x4 Power Supply (500 V, 1000 mA, 200 W)	BP-500x4	1 unit
SERVA BlueShake 3D	BS-3D	1 unit
Digital Imaging and Analysis System III, basic	DIAS III-B	1 system
Digital Imaging and Analysis System III (incl. GelScan 1D Analysis Software GS 6.0)	DIAS III	1 system
Digital Imaging and Analysis System III L-340 (incl. LabImage 1 D Analysis Software L-340)	DIAS III-L	1 system

# SERVA

SERVA WORLDWIDE

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